9 Miscellaneous

This chapter presents data that can be used to compare Wisconsin's energy consumption to non-energy indicators. The first table contains national population, energy and economic data. The remaining tables give Wisconsin-specific data.

Wisconsin's population is provided for readers interested in making per capita comparisons. Other indicators helpful in comparing current and past state energy use statistics are the number of households and personal income in Wisconsin. For purposes of explaining recent increases in residential energy use, personal income per capita and per household are shown in current and constant 2007 dollars. Similarly, the number of motor vehicles registered in the state will help in comparing current and past use of motor fuels, while appliance data makes it easier to understand residential energy use trends. Employment trends indicate changes in economic activity in the commercial and industrial sectors.

Because the energy needed to heat and cool homes and other buildings strongly depends on the outdoor temperature, a final set of tables lists typical and historic degree day figures throughout Wisconsin in eleven degree day zones. The heating and cooling degree days shown are relative measures of outdoor air temperature and are defined as deviations of the mean daily temperature below or above a base temperature of 65 degrees Fahrenheit. In addition to heating and cooling degree days in different parts of the state, population-weighted averages for the state are offered for readers interested in comparing the severity of winters and summers to statewide energy use.

United States Population, Gross Domestic Product, Resource Energy Consumption and Electricity Sales 1970-2007

Until the early 1970s, energy use kept pace with the growth in the nation's economy. Economic growth during the 1970s and early 1980s was accompanied by slower growth in energy use due to increases in efficiency and a shift away from energy intensive industries. Efficiency, in terms of decreasing energy required to produce a dollar of Gross Domestic Product, continues to increase slowly. The ratio between electric sales and Gross Domestic Product has fallen about 20 percent since 1980, while energy use per dollar of Gross Domestic Product declined about 42 percent over the same period.

Year	Resident Population (Thousands)[a,r]	Gross Domestic Product (Bil. of 2000$)	Resource Energy Consumption (Quad. Btu)[c]	Electric Sales to Ultimate Customers (Bil. of kWh)	Resource Energy Per GDP (Thous. Btu/2000$)	Electric Sales Per GDP (kWh/2000$)
1970	205,052	3,771.9	68.00	1,391.4	18.03	0.3689
1975	215,973	4,311.2	72.00	1,747.1[d]	16.70	0.4052
1980	227,225	5,161.7	78.12	2,094.4	15.13	0.4058
1985	237,924	6,053.7	76.49	2,324.0	12.64	0.3839
1990	249,623	7,112.5	84.65	2,712.6	11.90	0.3814
1995	266,278	8,031.7	91.17	3,013.3	11.35	0.3752
2000	282,217	9,817.0	98.98	3,421.4	10.08	0.3485
2001	285,226	9,890.7	96.33	3,394.5	9.74	0.3432
2002	288,126	10,048.8	97.86	3,465.5	9.74	0.3449
2003[r]	290,448	10,301.0	98.21	3,493.7	9.53	0.3392
2004[r]	293,192	10,675.8	100.35	3,547.5	9.40	0.3323
2005[r]	295,896	11,003.4	100.51	3,661.0	9.13	0.3327
2006[r]	298,755	11,319.4	99.86	3,670.0	8.82	0.3242
2007	**301,621**	**11,566.8**	**101.60**	**3,748.0**	**8.78**	**0.3240**

[a] As of July 1.

[c] Quadrillions of Btu.

[d] Beginning in 1975, the DOE data source has been used.

[r] Revised.

Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* (May 2008), http://www.eia.doe.gov/mer/; U.S. Department of Commerce, Bureau of Census, *Estimates of the Population of the United States; Annual Time Series*, Series NA-EST 2006-01 (May 2008). http://www.census.gov/popest/national/NA-EST2007-01.html; U.S. Department of Commerice, Bureau of Economic Analysis, http://www.bea.gov/bea/regional/.

Wisconsin Population, Number of Households, Real Gross State Product and Total and Per Capita Personal Income 1970-2007

Wisconsin's population and number of households continue to grow. The number of households has grown faster than the population, as the number of persons per household has declined. Household income growth, in constant 2007 dollars, has been about 1.4 percent annually over the seventeen-year period since 1990. Gross State Product in 2007 dollars increased by 2.6 percent, reflecting a growing Wisconsin economy.

Year	GDP Deflator	Population[a,r] (Thousands)	No. of Households[b,r] (Thousands)	Gross State Product (Million 2007 Dollars)	Personal Income[r] (Current Dollars)			Personal Income[r] (2007 Dollars)		
					Total (Million Dollars)	Dollars Per Capita	Dollars Per Household	Total (Million Dollars)	Dollars Per Capita	Dollars Per Household
1970	27.53	4,417.8	1,328.8	85,477	17,609	3,986	13,252	76,538	17,325	57,599
1975	38.00	4,565.8	1,486.8	96,137	27,810	6,091	18,705	87,572	19,180	58,900
1980	54.04	4,705.6	1,652.3	114,662	47,623	10,120	28,823	105,451	22,410	63,822
1985	69.71	4,744.7	1,720.4	124,185	65,709	13,849	38,195	112,792	23,772	65,563
1990	81.59	4,891.8	1,822.1	142,661	88,635	18,119	48,644	129,992	26,573	71,341
1995	92.11	5,134.1	1,946.3	168,926	115,180	22,434	59,179	149,630	29,144	76,879
1996	93.85	5,182.0	1,971.6	175,263	121,718	23,489	61,736	155,192	29,948	78,714
1997	95.41	5,233.9	1,998.4	184,309	129,099	24,666	64,601	161,912	30,935	81,021
1998	96.47	5,280.0	2,024.5	193,267	138,667	26,263	68,494	172,001	32,576	84,960
1999	97.87	5,323.7	2,053.9	200,380	144,702	27,181	70,452	176,919	33,232	86,138
2000	100.00	5,363.7	2,084.6	203,915	153,548	28,627	73,658	183,736	34,255	88,139
2001	102.40	5,401.9	2,104.7	206,160	158,888	29,413	75,492	185,669	34,371	88,217
2002	104.19	5,441.2	2,142.6	210,040	163,309	30,013	76,220	187,557	34,470	87,537
2003	106.41	5,472.3	2,159.1	214,082	168,120	30,722	77,866	189,054	34,547	87,561
2004	109.46	5,509.0	2,172.9	220,283	174,655	31,704	80,379	190,930	34,658	87,869
2005	113.00	5,536.2	2,219.6	222,650	181,889	32,854	81,947	192,615	34,791	86,777
2006	116.57	5,556.5	2,230.0	226,500	191,726	34,505	85,976	196,819	35,419	88,255
2007[p]	**119.66**	**5,601.6**	**2,240.5**	**232,293**	**201,921**	**36,047**	**90,123**	**201,921**	**36,047**	**90,123**

[a] As of July 1. Population Estimates from the US Census Bureau, vintage year data. http://www.census.gov/popest/archives/2000s/

[b] Household numbers for intercensal years estimated on basis of Public Service Commission of Wisconsin reports of electric utility residential customers. Starting in 2001, household numbers are from the American Community Survey: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=

[p] Preliminary estimates.

[r] Revised.

Source: U.S. Department of Commerce, Bureau of Census, *2000 Census of Population and Housing*, CPH-1-51 (August 2001) Final Official Population Estimates and Census Counts for Wisconsin Counties: 1970 – 2006; Bureau of Census American Community Survey, see citation in footnote; U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, http://www.bea.gov/bea/regional/

Wisconsin Employment, by Type 1970-2007

(Thousands)

In 2007, Wisconsin's working age labor force increased 0.9 percent and employment in the state increased 0.5 percent (14,100 jobs). Employment in the goods producing sector decreased 1.1 percent compared to an increase of 1.1 percent in the services producing sector and a .5 percent increase in the nonfarm sector. Most Wisconsin jobs are classified as services producing.

Year	Working Age 18-64	Total Employment[a]	Percent Working Age Employed	Total NonFarm[c,e]	Goods Producing[c,d]	Services Producing[c,e]
1970	2,362.6	1,530.5	(64.8%)		Data Not Available[b]	
1975	2,572.5	1,677.0	(65.2)		Data Not Available[b]	
1980	2,783.7	1,938.1	(69.6)		Data Not Available[b]	
1985	2,858.3	1,983.1	(69.4)		Data Not Available[b]	
1990[r]	2,949.3	2,486.1	(84.3)	2291.5	614.8	1,676.7
1995[r]	3,122.9	2,773.6	(88.8)	2558.6	672.5	1,886.1
2000[r]	3,292.4	2,894.9	(87.9)	2833.8	723.0	2,110.8
2001[r]	3,336.3	2,897.9	(86.9)	2813.9	689.5	2,124.3
2002[r]	3,379.4	2,860.9	(84.7)	2782.4	656.2	2,126.1
2003[r]	3,417.8	2,862.6	(83.8)	2143.4	631.9	2,143.4
2004[r]	3,455.2	2,867.1	(83.0)	2807.1	633.3	2,173.8
2005[r]	3,490.6	2,884.8	(82.6)	2842.1	636.4	2,205.7
2006[r]	3,525.8	2,923.8	(82.9)	2866.4	637.2	2,229.3
2007[p]	**3,558.3**	**2,937.9**	**(82.6)**	**2881.7**	**629.9**	**2,251.8**

[a] Nonfarm wage and salary employment.

[b] Industry employment data prior to 1990 are not available due to a change in coding from the Standard Industrial Classification (SIC) system to the North American Industrial Classification System (NAICS).

[c] These data categories represent numbers of jobs, not numbers of individuals.

[d] Goods Producing is a compilation of the Mining, Natural Resources, and Construction industries.

[e] Services Producing is a compilation of all non-farm jobs that do not produce goods.

[f] Total Non-Farm job is a compilation of many non-farm job categories, which includes Goods Producing and Services Producing.

[r] Revised

[p] Preliminary

Source: Wisconsin Department of Administration, Demographic Services Center, *Final Population Projections for Wisconsin by Sex and Single Year of Age, 2000 – 2015* (January 2004); Wisconsin Department of Workforce Development, unpublished employment data (http://worknet.wisconsin.gov/worknet/daces.aspx?menuselection=da) 1990-2007.

Wisconsin Occupied Dwelling Units, by Type of Fuel for Space Heating, 1970, 1980, 1990, 2000 and 2005

(Number of Units and Percent of Total)

Fuel	1970		1980		1990		2000		2005	
Natural Gas	654,851	(49.3%)	945,092	(57.2%)	1,111,733	(61.0%)	1,384,230	(66.4%)	1,453,768	(65.5%)
Fuel Oil[a]	521,256	(39.2%)	425,622	(25.8%)	265,600	(14.6%)	158,499	(7.6%)	129,925	(5.9%)
LP Gas	85,549	(6.4%)	130,476	(7.9%)	152,823	(8.4%)	228,408	(11.0%)	250,739	(11.3%)
Electricity	24,763	(1.9%)	101,489	(6.1%)	168,615	(9.3%)	236,755	(11.4%)	288,829	(13.0%)
Wood	6,795	(0.5%)	42,783	(2.6%)	107,239	(5.9%)	56,862	(2.7%)	72,452	(3.3%)
Coal or Coke	29,708	(2.2%)	2,591	(0.2%)	787	b	330	b	583	b
Other	5,334	(0.4%)	3,578	(0.2%)	11,294	(0.6%)	13,839	(0.7%)	17,306[c]	(0.8%)
None	548	b	630	b	4,027	(0.2%)	5,621	(0.3%)	5,969	(0.3%)
Total	**1,328,804**		**1,652,261**		**1,822,118**		**2,084,544**		**2,219,571**	

[a] Includes kerosene.

[b] Less than 0.05 percent.

[c] Includes solar.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Housing* (1970, 1980, 1990 and 2000) and 2005 American Community Survey.

Wisconsin Occupied Dwelling Units, by Type of Fuel for Water Heating, 1970, 1980, 1990, 2000 and 2005

(Number of Units and Percent of Total)

Fuel	1970		1980		1990[c]		2000[c]		2005[c]	
Natural Gas	668,219	(50.3%)	877,135	(53.1%)	1,036,118	(56.9%)	1,244,544	(59.7%)	1,354,443	(61.0%)
Fuel Oil[a]	36,913	(2.8%)	36,048	(2.2%)	32,000	(1.8%)	25,000	(1.2%)	19,911	(0.9%)
LP Gas	93,955	(7.1%)	125,741	(7.6%)	150,000	(8.2%)	220,000	(10.6%)	256,850	(11.6%)
Electricity	491,803	(37.0%)	599,827	(36.3%)	592,000	(32.5%)	585,000	(28.1%)	579,407	(26.1%)
Wood	864	(0.1%)	b		b		b		b	
Coal or Coke	3,612	(0.3%)	b		b		b		b	
Other	1,389	(0.1%)	4,755	(0.3%)	7,000	(0.4%)	6,000	(0.3%)	5,476	(0.2%)
None	32,049	(2.4%)	8,755	(0.5%)	5,000	(0.3%)	4,000	(0.2%)	3,484	(0.2%)
Total	**1,328,804**		**1,652,261**		**1,822,118**		**2,084,544**		**2,219,571**	

[a] Includes kerosene.

[b] Included with "Other".

[c] Estimate by Wisconsin Office of Energy Independence.

Source: U.S. Department of Commerce, Bureau of the Census, *Census of Housing* (1970, 1980, 1990 and 2000).

Wisconsin Motor Vehicle Registrations, by Type of Vehicle[a], 1970-2007

In 2007, total vehicle registrations increased by 2.4 percent; auto registrations decreased slightly. The truck category includes vans, sports utility vehicles and light trucks.

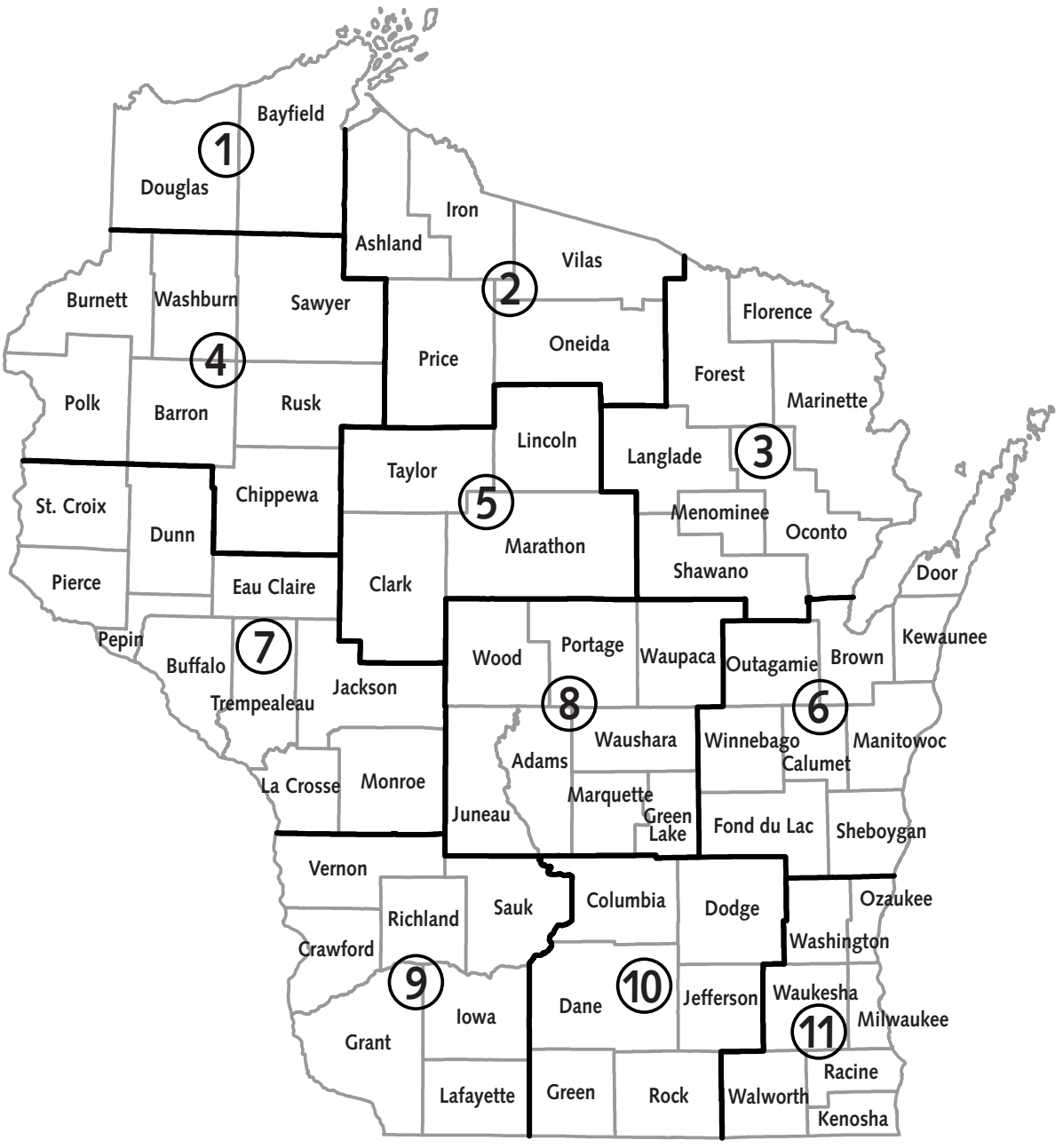
Year[a]	Autos	Trucks	Buses	Motorcycles	Trailers	Total[b]
1970	1,762,681	317,096	8,178	53,642	64,065	2,210,492
1975	2,023,427	426,756	11,422	96,629	81,378	2,644,681
1980	2,248,951	665,012	13,375	169,329	93,288	3,215,302
1985	2,310,024	771,264	10,325	176,037	101,030	3,406,196
1990	2,456,175	1,053,280	14,518	149,281	152,712	3,825,966
1995	2,419,389	1,399,236	14,940	161,773	240,841	4,281,803
1996	2,398,351	1,464,366	15,413	136,794	205,177	4,260,959
1997	2,370,453	1,537,241	12,497	161,509	213,415	4,339,088
1998	2,402,019	1,668,241	17,061	151,391	231,934	4,513,250
1999	2,396,072	1,735,326	14,546	171,839	242,849	4,605,088
2000	2,405,408	1,822,078	15,587	160,927	256,890	4,703,294
2001	2,413,001	1,922,916	16,259	192,312	269,931	4,860,457
2002	2,404,081	2,012,847	17,061	183,890	285,471	4,948,282
2003	2,401,816	2,103,643	17,555	215,231	303,852	5,091,716
2004	2,387,459	2,176,903	14,099	207,592	334,898	5,170,728
2005	2,384,717	2,280,170	12,418	278,055	365,435	5,320,795
2006	2,427,905	2,354,954	13,222	266,195	396,374	5,458,650
2007	**2,427,882**	**2,404,895**	**14,110**	**324,833**	**419,816**	**5,591,536**

[a] As of June 30.

[b] Total includes motor homes, mopeds and municipal vehicles; it does not equal sum of registration types shown before 2005. From 2005 on, motor homes, mopeds and municipal vehicles are included in trucks, motorcycles and autos, respectively.

Source: Wisconsin Department of Transportation (June 2008).

Wisconsin Division of Energy Services Degree Day Zones



Source: Wisconsin Department of Administration, Division of Energy Services.

Wisconsin Normal Heating Degree Days, by Zone and Month[a]

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[b]
January	1,715	1,688	1,612	1,678	1,654	1,537	1,647	1,635	1,568	1,490	1,384	1,507
February	1,374	1,371	1,321	1,317	1,329	1,270	1,301	1,311	1,233	1,209	1,132	1,223
March	1,182	1,176	1,120	1,088	1,107	1,065	1,064	1,086	997	978	949	1,016
April	768	725	682	621	637	638	601	629	576	576	611	616
May	412	367	334	286	316	301	263	301	263	261	318	300
June	138	128	106	83	79	85	58	71	51	63	86	79
July	48	50	35	27	18	19	16	20	13	12	13	17
August	71	83	60	53	57	38	31	50	42	33	18	33
September	267	283	246	218	232	208	197	208	171	183	134	180
October	614	640	590	555	572	540	551	535	501	504	443	505
November	1044	1,057	991	1,018	1,012	925	997	986	937	892	808	900
December	1,517	1,512	1,431	1,508	1,480	1,350	1,470	1,450	1,378	1,298	1,200	1,323
Total	**9,150**	**9,080**	**8,528**	**8,452**	**8,493**	**7,976**	**8,196**	**8,282**	**7,730**	**7,499**	**7,096**	**7,699**

[a] Heating degree days are relative measurements of outdoor air temperature and are defined as deviations of the mean daily temperature below a base temperature (65 degrees Fahrenheit, by convention). For example, a weather station recording a mean daily temperature of 40 degrees Fahrenheit would report 25 heating degree days. The normal heating degree days for each zone and month are the 30-year averages, from 1971 through 2000.

[b] Population-weighted statewide average, based on 2000 census.

Wisconsin Normal Cooling Degree Days, by Zone and Month[a]

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[b]
April	0	0	1	1	1	3	1	1	1	6	5	3
May	10	25	25	38	29	24	44	36	35	33	27	30
June	31	52	73	85	88	95	111	92	108	123	114	105
July	116	117	147	164	166	177	214	164	200	214	222	199
August	83	83	105	121	125	126	155	120	163	154	180	151
September	10	11	23	20	16	36	28	27	35	48	63	44
October	0	0	1	0	0	2	1	1	1	4	5	3
Total	**250**	**288**	**375**	**429**	**425**	**463**	**554**	**441**	**543**	**582**	**616**	**535**

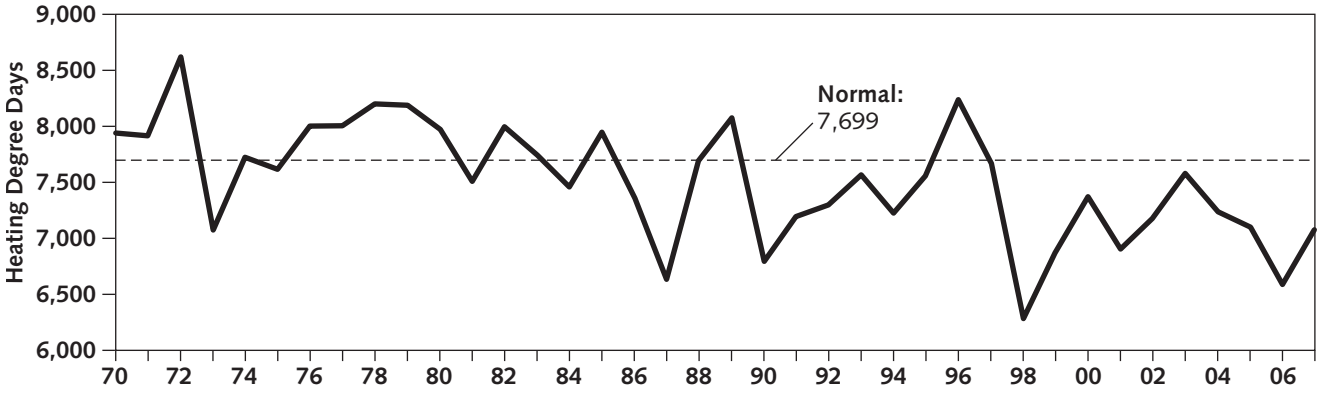
[a] Cooling degree days are relative measurements of outdoor air temperature and are defined as deviations of the mean daily temperature above a base temperature (65 degrees Fahrenheit, by convention). For example, a weather station recording a mean daily temperature of 90 degrees Fahrenheit would report 25 cooling degree days. The normal cooling degree days for each zone and month are the 30-year averages, from 1971 through 2000.

[b] Population-weighted statewide average, based on 2000 census.

Source for both tables: National Oceanic and Atmospheric Administration, "Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1971-2000 Wisconsin" *Climatology of the United States No. 81 (by State)*, (December 2000).

Wisconsin Population-Weighted Heating Degree Days, by Month[a], Normal and 1970-2007

There were 8.1 percent fewer heating degree days in 2007 than the normal and 7.6 percent more than in 2006. Over the past 10 years, there were an average of 7,011 heating degree days, 8.9 percent fewer than the 30-year normal.



Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Normal	**1,507**	**1,223**	**1,016**	**616**	**300**	**79**	**17**	**33**	**180**	**505**	**900**	**1,323**	**7,699**
1970	1,715	1,292	1,116	565	295	81	15	15	179	430	888	1,343	7,934
1975	1,375	1,246	1,212	790	221	74	23	17	258	412	713	1,268	7,609
1980	1,465	1,378	1,141	582	240	117	8	14	177	634	867	1,345	7,968
1985	1,614	1,296	883	474	189	107	7	32	194	486	993	1,660	7,935
1990	1,141	1,119	880	532	361	52	19	19	131	497	708	1,321	6,780
1995	1,344	1,197	890	682	254	38	8	1	213	455	1,097	1,375	7,554
2000	1,428	1,057	759	626	245	86	26	15	189	384	909	1,636	7,360
2001	1,335	1,287	1,069	491	251	96	19	7	192	495	581	1,072	6,895
2002	1,160	1,000	1,129	604	416	68	1	8	106	615	903	1,163	7,173
2003	1,477	1,333	1,025	644	345	97	10	5	167	484	841	1,142	7,570
2004	1,570	1,199	876	555	324	98	22	78	79	429	749	1,253	7,232
2005	1,436	1,043	1,073	491	331	20	9	12	75	425	811	1,369	7,095
2006	1,044	1,203	949	441	265	46	3	7	190	599	761	1,068	6,576
2007	**1,282**	**1,398**	**853**	**615**	**201**	**35**	**11**	**13**	**130**	**319**	**879**	**1,337**	**7,073**

[a] Population-weighted heating degree days are derived by multiplying the number of heating degree days in each degree day zone by the population in that degree day zone, adding the products, then dividing by the total state population (based on 2000 census data).

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

2006 Wisconsin Heating Degree Days, by Zone and Month

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	1,235	1,238	1,149	1,161	1,207	1,060	1,128	1,088	1,101	1,029	955	1,044
February	1,396	1,374	1,326	1,319	1,338	1,279	1,272	1,259	1,222	1,192	1,092	1,203
March	1,154	1,075	1,029	1,009	1,054	983	997	966	957	935	888	949
April	569	499	482	385	475	465	383	426	420	417	451	441
May	385	298	280	235	307	262	222	264	287	257	270	265
June	122	56	54	35	42	52	27	41	49	36	50	46
July	11	4	5	1	0	6	0	2	4	2	3	3
August	39	13	17	6	19	20	3	4	9	2	0	7
September	309	237	227	265	268	218	227	223	212	215	125	190
October	746	756	685	707	708	613	648	616	617	611	527	598
November	888	908	834	907	864	761	863	783	805	762	686	761
December	1,203	1,269	1,168	1,188	1,214	1,066	1,129	1,102	1,122	1,062	996	1,068
Total	**8,057**	**7,727**	**7,256**	**7,218**	**7,496**	**6,785**	**6,899**	**6,774**	**6,805**	**6,520**	**6,043**	**6,576**

[a] Population-weighted statewide average, based on 2000 census.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

2007 Wisconsin Heating Degree Days, by Zone and Month

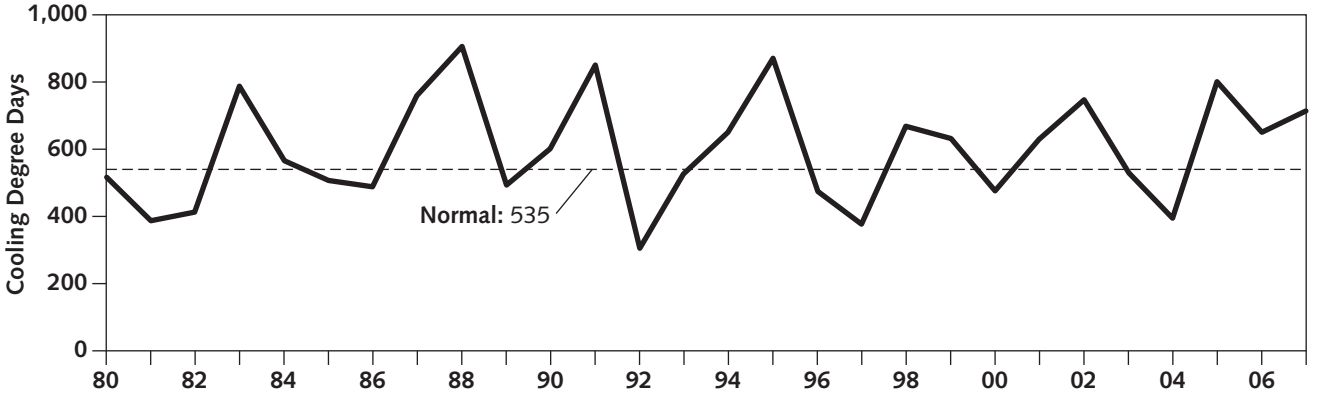
Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
January	1,461	1,463	1,379	1,492	1,398	1,295	1,413	1,308	1,351	1,283	1,175	1,282
February	1,550	1,544	1,465	1,540	1,484	1,386	1,489	1,432	1,526	1,408	1,317	1,398
March	1,011	1,055	976	979	959	897	881	886	871	825	779	852
April	768	731	669	648	655	607	593	623	603	592	612	615
May	332	284	242	193	222	200	171	160	147	145	232	201
June	113	53	47	32	44	42	23	33	29	21	36	35
July	64	48	34	17	19	19	6	8	3	2	7	11
August	44	49	34	26	29	20	21	17	13	6	3	13
September	202	203	174	200	183	145	149	137	147	117	98	130
October	466	442	397	439	401	341	390	355	371	299	252	319
November	997	1,030	964	961	981	899	955	903	926	883	803	879
December	1,541	1,549	1,445	1,564	1,524	1,341	1,508	1,427	1,451	1,350	1,194	1,337
Total	**8,549**	**8,451**	**7,826**	**8,091**	**7,899**	**7,192**	**7,599**	**7,289**	**7,438**	**6,931**	**6,508**	**7,073**

[a] Population-weighted statewide average, based on 2000 census.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin Population-Weighted Cooling Degree Days, by Month[a], Normal and 1980-2007

Using cooling degree days as an index, the summer of 2007 was warmer than the summer of 2006, with 9.8 percent more cooling degree days. In 2007, the number of cooling degree days was 33.1 percent above the normal.



Month	April[b]	May	June	July	August	September	October[b]	Total
Normal	**3**	**30**	**105**	**199**	**151**	**44**	**3**	**535**
1980	9	34	71	218	156	27	0	515
1985	31	28	60	185	98	103	0	505
1990	32	3	120	176	164	99	4	598
1995	0	8	223	273	310	47	5	866
2000	0	37	88	136	154	53	5	473
2001	5	20	126	234	213	29	1	628
2002	20	20	162	297	152	87	6	744
2003	2	1	69	163	223	66	4	528
2004	3	11	66	140	83	87	1	391
2005	3	4	211	228	200	119	32	797
2006	1	52	94	302	169	26	4	648
2007	**8**	**48**	**132**	**201**	**196**	**90**	**37**	**712**

[a] Population-weighted cooling degree days are derived by multiplying the number of cooling degree days in each degree day zone by the population in that degree day zone, adding the products, then dividing by the total state population (based on 2000 census data).

[b] Includes March for the years 2001 and 2007. For 1990, the October column also includes November.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin Cooling Degree Days, by Zone and Month 2004-2007

Month	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	State[a]
2004												
April	0	0	0	0	0	0	2	1	5	4	6	3
May	0	5	7	6	2	9	4	7	5	16	15	11
June	14	44	47	53	49	51	63	67	86	89	70	66
July	79	97	107	129	123	116	159	138	133	155	151	140
August	21	30	51	53	46	73	71	68	69	91	105	83
September	29	60	70	83	64	79	100	88	72	93	93	87
October	0	0	0	0	0	0	1	0	0	2	2	1
Total	**143**	**236**	**282**	**324**	**284**	**328**	**400**	**369**	**370**	**450**	**442**	**391**
2005												
April	0	0	0	8	0	1	4	4	3	2	4	3
May	0	2	3	3	1	3	4	4	4	7	4	4
June	83	145	174	162	168	203	188	208	204	239	229	211
July	128	204	195	257	202	187	257	235	231	239	242	228
August	66	125	136	165	135	147	170	163	156	195	269	200
September	47	67	72	98	65	77	92	100	93	131	162	119
October	1	16	24	10	23	31	30	30	26	34	39	32
Total	**325**	**559**	**604**	**703**	**594**	**649**	**745**	**744**	**717**	**847**	**949**	**797**
2006												
April	0	0	0	0	0	0	0	0	0	2	3	1
May	23	55	51	68	49	47	78	62	56	63	42	52
June	56	67	71	112	75	76	146	100	84	90	98	94
July	252	243	257	345	251	271	376	289	258	297	316	302
August	98	103	107	134	107	110	177	157	172	161	222	169
September	6	35	24	21	10	14	22	20	16	18	39	26
October	0	0	2	0	0	3	4	4	9	6	3	4
Total	**435**	**503**	**512**	**680**	**492**	**521**	**803**	**632**	**595**	**637**	**723**	**648**
2007												
March	0	0	1	0	0	2	4	2	4	5	7	4
April	0	0	2	2	0	3	7	8	4	5	3	4
May	28	24	35	28	39	46	54	60	41	62	46	48
June	65	83	104	143	114	124	152	161	131	139	132	132
July	163	146	157	205	152	168	225	200	169	222	219	201
August	114	117	138	150	141	160	170	176	176	219	235	195
September	39	62	71	57	63	80	80	77	69	91	113	90
October	4	18	26	17	33	33	35	38	29	38	45	37
Total	**413**	**450**	**534**	**602**	**542**	**616**	**727**	**722**	**623**	**781**	**800**	**712**

[a] Population-weighted statewide average, based on 2000 census.

Source: Wisconsin Department of Administration, Division of Energy Services, degree day data based on daily data from the University of Wisconsin-Madison, Department of Meteorology.

Wisconsin New Single and Two Family Building Permits 1990-2007[a,b]

From 2006 to 2007, there was a 18 percent decrease in construction for single family building permits, and a 51 percent decrease for two-family building permits. There was a 10 percent decrease in the use of oil for heating, and increased saturation of air conditioning and natural gas and propane as the preferred energy sources for space and water heating.

	1990		2000		2005		2006		2007	
Type										
Single Family	9,630	93.7%	18,456	94.0%	22,372	93.7%	16,568	93.7%	14,003	95.0%
Two Family	649	6.3%	1,184	6.0%	1,495	6.3%	1,114	6.3%	740	5.0%
Heating Equipment										
Forced Air	9,486	92.3%	17,874	95.9%	21,462	91.9%	15,706	84.3%	12,823	79.2%
Radiant Electric	118	1.1%	324	1.7%	484	2.1%	431	2.3%	346	2.1%
Heat Pump	12	0.1%	55	0.3%	165	0.7%	193	1.0%	233	1.4%
Boiler	75	0.7%	379	2.0%	968	4.1%	884	4.7%	894	5.5%
Not Specified	588	5.7%	8	0.0%	271	1.2%	1,423	7.6%	1,892	11.7%
AC Equipped										
Yes	2,415	23.5%	11,151	56.8%	15,849	66.4%	11,678	65.9%	9,639	65.4%
No	7,864	76.5%	8,489	43.2%	8,036	33.6%	6,047	34.1%	5,109	34.6%
Space Heating Source										
Natural Gas	8,312	80.9%	12,386	63.3%	15,605	65.6%	10,174	57.2%	7,767	52.3%
LP Gas	860	8.4%	3,782	19.3%	4,552	19.1%	3,981	22.4%	3,619	24.4%
Oil	60	0.6%	56	0.3%	44	0.2%	17	0.1%	9	0.1%
Electric	128	1.2%	153	0.8%	278	1.2%	280	1.6%	253	1.7%
Solid	12	0.1%	0	0.0%	26	0.1%	121	0.7%	169	1.1%
Solar	0	0.0%	0	0.0%	26	0.1%	121	0.7%	109	0.7%
Not Specified	907	8.8%	3,200	16.3%	3,262	13.7%	3,081	17.3%	2,929	19.7%
Water Heating Source										
Natural Gas	8,066	78.5%	12,448	63.4%	14,225	59.6%	8,955	50.5%	7,437	50.6%
LP Gas	720	7.0%	2,817	14.3%	3,305	13.8%	2,512	14.2%	2,665	18.1%
Oil	18	0.2%	8	0.0%	12	0.1%	9	0.1%	5	0.0%
Electric	480	4.7%	1,449	7.4%	1,952	8.2%	1,810	10.2%	1,933	13.2%
Solid	4	0.0%	21	0.1%	15	0.1%	94	0.5%	42	0.3%
Solar	0	0.0%	7	0.0%	43	0.2%	22	0.1%	1	0.0%
Not Specified	991	9.6%	2,890	14.7%	4,333	18.1%	4,321	24.4%	2,605	17.7%
Living Area (Sq. Ft)										
1-1,000	208	2.1%	670	3.6%	579	2.5%	531	3.1%	576	4.1%
1,001-1,800	4,292	43.6%	8,027	43.1%	8,613	37.8%	6,354	37.2%	5,567	39.3%
1,801-2,400	2,903	29.5%	5,228	28.1%	6,717	29.5%	4,854	28.4%	3,635	25.7%
2,401-Greater	2,451	24.9%	4,689	25.2%	6,852	30.1%	5,324	31.2%	4,378	30.9%
Total	**9,854**		**18,614**		**22,761**		**17,063**		**14,156**	
Average (Sq. Ft)	2,013		1,944		2,101		2,150		2,104	

[a] These statistics are incomplete before January 1, 2005, as not all municipalities who issue building permits reported this information.

[b] These statistics are for the period July 1 to June 30.

Source: Wisconsin Department of Commerce, Division of Safety and Buildings http://www.commerce.state.wi.us/SB/SB-StatsUDCStatisticsList.html

Energy Definitions and Conversion Factors

Definitions

Energy is the ability to do work. It is stored in various forms including chemical energy in biomass, coal and oil, nuclear energy in uranium, gravitational energy in water used in hydroelectric plants, the wind and the sun.

There are two common ways to account for energy use; **resource energy** consumption and **end use energy** consumption. End use refers to the energy content of electricity and other fuels at the point of use by customers. Resource energy includes all energy resources used to generate electricity, including the energy content of the coal, petroleum, nuclear and renewable fuels.

One **British thermal unit (Btu)** is the amount of energy in the form of heat which will raise the temperature of one pound of water one degree Fahrenheit.

One **calorie** is the amount of energy in the form of heat which will raise the temperature of one gram of water one degree Centigrade.

One **Btu** is equal to 252 calories.

One **watt** is a unit of power, or rate of energy delivery, of one joule per second, or equivalently, one ampere of electric current delivered across a potential of one volt. One kilowatt (kW) is 1,000 watts. Ten 100-watt light bulbs require 1,000 watts or 1 kW of power to stay lit at any point in time.

One **kilowatt-hour (kWh)** is one kilowatt of electric power delivered for one hour (or the equivalent). One kilowatt-hour is 1,000 watt-hours. Ten 100-watt light bulbs burning for one hour consume 1,000 watt-hours or 1 kWh.

Heating degree days are relative measurements of outdoor air temperature and are obtained by subtracting the mean daily temperature from an established base temperature of 65 degrees Fahrenheit.

Cooling degree days are relative measurements of outdoor air temperature and are obtained by subtracting an established base temperature of 65 degrees Fahrenheit from the mean daily temperature.

Measurement of Energy Supplies

Petroleum products are measured in either gallons or barrels. A barrel contains 42 gallons. Petroleum is refined from crude oil into various products such as kerosene, diesel fuel, home heating oil (No. 1 and No. 2 oils), and other heating oils (No. 3 - No. 6), gasoline and liquefied petroleum gas (propane). The energy content of a gallon of each product is listed in the conversion table.

Natural Gas is measured in either Mcf (1,000 cubic feet) or in therms. One Mcf contains approximately ten therms or one million Btu.

Coal is measured in tons. The three broad classifications of coal, in order of greatest energy content, are bituminous, sub-bituminous and lignite.

Wood is usually measured in either tons or cords. A cord is an amount of stacked wood measuring 8 feet x 4 feet x 4 feet. The weight of a cord of wood varies according to the type of wood and its moisture content, but is estimated at 1.5 to 2 tons. A face cord is the 8 feet x 4 feet face of a stacked cord but of shorter width. Common usage is three face cords to a full cord.

Conversion Factors

Average Energy Content of Various Fuels

1 kilowatt-hour of electricity . . . . . .3,413 Btu
1 cubic foot of natural gas . . . . . .1,008 to 1,034 Btu
1 therm of natural gas . . . . . .100,000 Btu
1 gallon of liquefied petroleum gas (LPG) . . . . . .95,475 Btu
1 gallon of crude oil . . . . . .138,095 Btu
1 barrel of crude oil . . . . . .5,800,000 Btu
1 gallon of kerosene or light distillate oil . . . . . .135,000 Btu
1 gallon of middle distillate or diesel fuel oil . . . . . .138,690 Btu
1 gallon of residual fuel oil . . . . . .149,690 Btu
1 gallon of gasoline . . . . . .125,000 Btu
1 gallon of ethanol . . . . . .84,400 Btu
1 gallon of methanol . . . . . .62,800 Btu
1 gallon of gasohol (10% ethanol, 90% gasoline) . . . . . .120,900 Btu
1 pound of coal . . . . . .8,100 to 13,000 Btu
1 ton of coal . . . . . .16,200,000 to 26,000,000 Btu
1 ton of coke . . . . . .26,000,000 Btu
1 ton of wood . . . . . .9,000,000 to 17,000,000 Btu
1 standard cord of wood . . . . . .18,000,000 to 24,000,000 Btu
1 face cord of wood . . . . . .6,000,000 to 8,000,000 Btu
1 pound of low pressure steam (recoverable heat) . . . . . .1,000 Btu

Measurement Conversions

1 short ton (ton) = 2,000 pounds = 6.65 barrels (crude oil)
1 metric ton (tonn) = 2,200 pounds
1 barrel (bbl) = 42 gallons = 5.615 cubic feet = 159.0 liters
1 Mcf = 1,000 cubic feet
1 therm = 10^5 Btu = 100,000 Btu
1 thousand Btu (KBtu) = 1,000 Btu
1 million Btu (MMBtu) = 1,000,000 Btu
1 quad = 10^{15} (quadrillion) Btu or 1,000,000,000 MMBtu
1 kilowatt-hour (kWh) = 1,000 watt-hours
1 megawatt-hour (MWh) = 1,000 kWh or 1,000,000 watt-hours
1 gigawatt-hour (GWh) = 1,000 MWh or 1,000,000,000 watt-hours
1 gallon = 4.524 pounds liquefied petroleum gas
1 standard cord of wood = 8 feet x 4 feet x 4 feet = 128 cubic feet = approx. 4,000 lbs.
1 face cord of wood = 8 feet x 4 feet x 16 inches = 42.7 cubic feet = approx. 1,333 lbs.